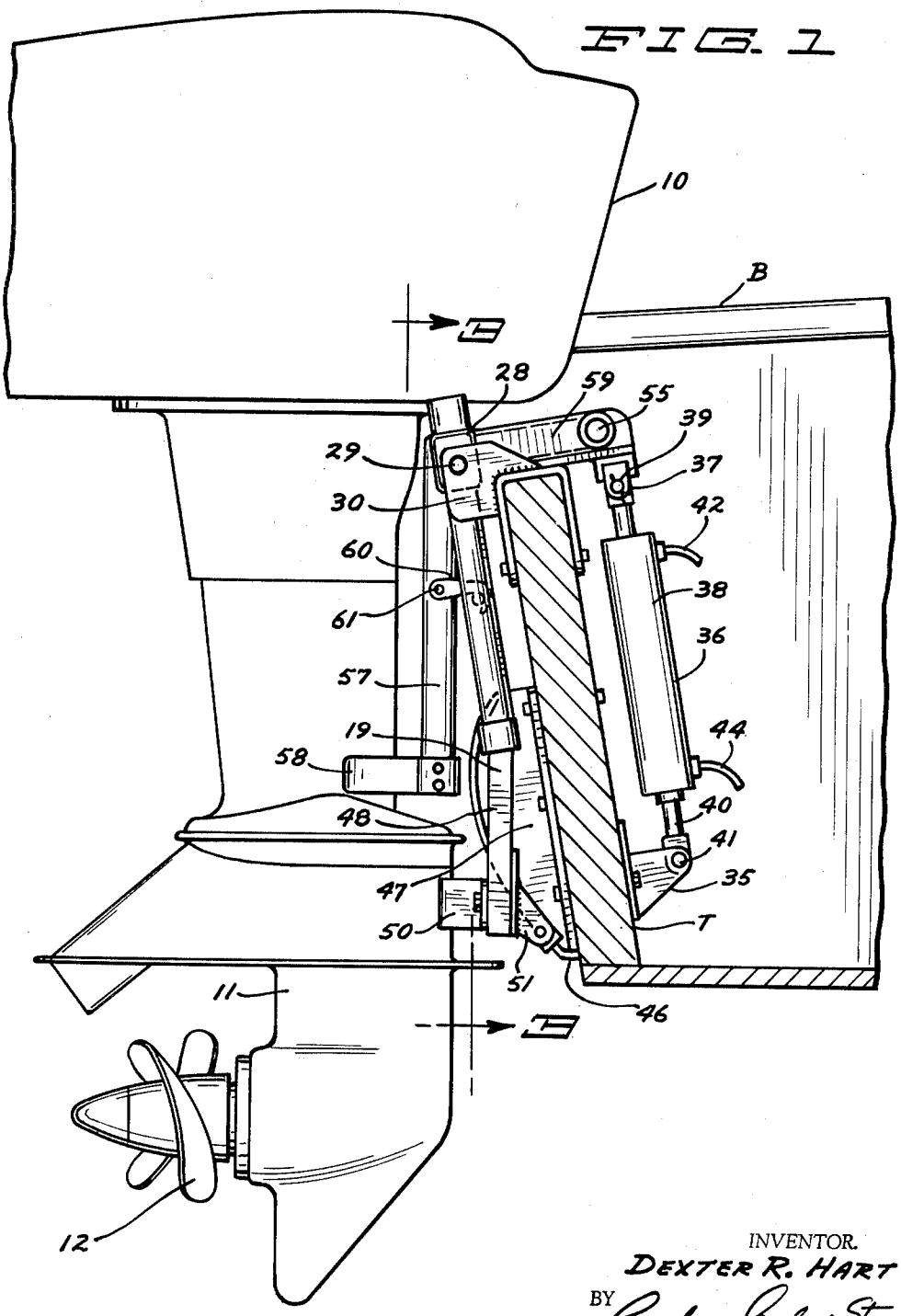
Aug. 18, 1964 D. R. HART 3,145,003

OUTBOARD MOTOR MOUNTING

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FIG. 1



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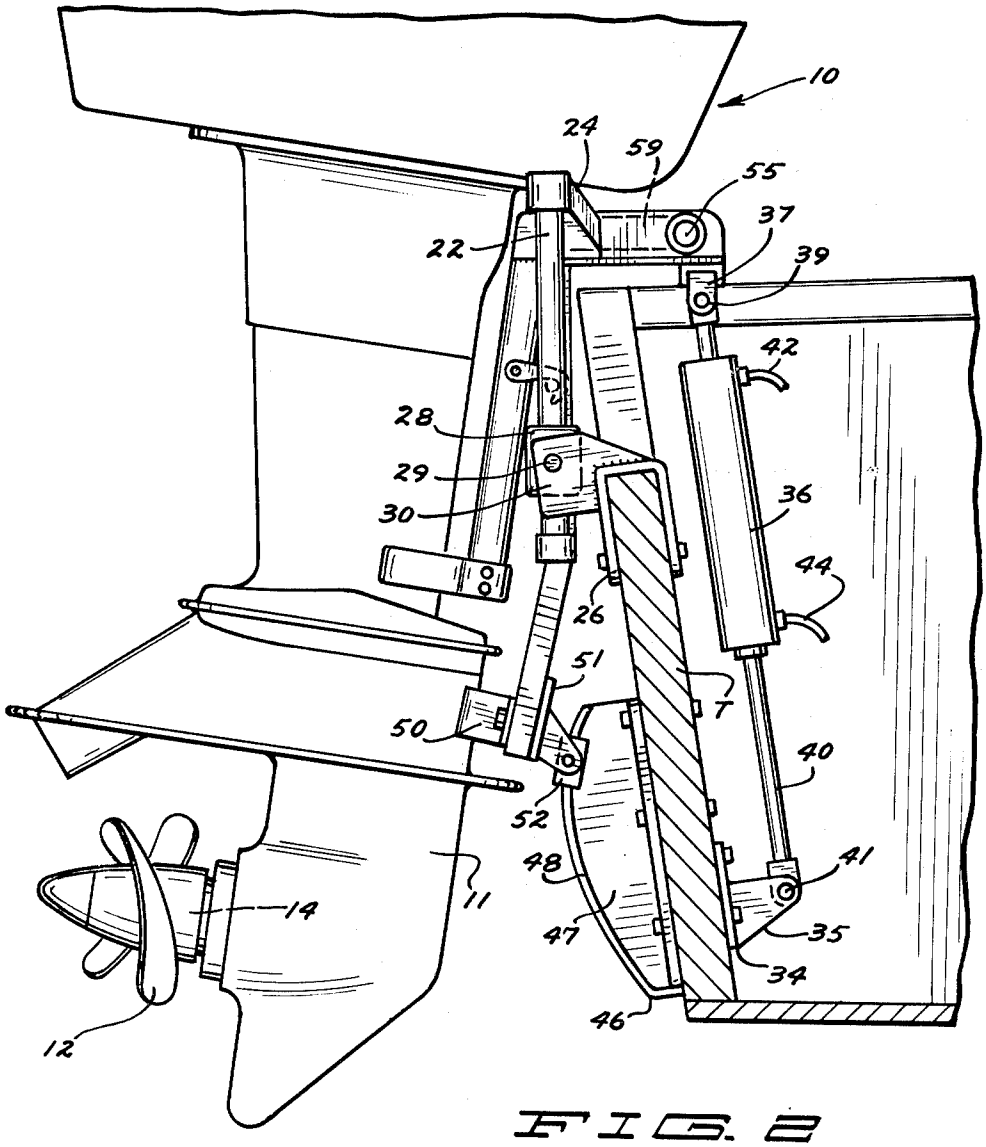


FIG. 2

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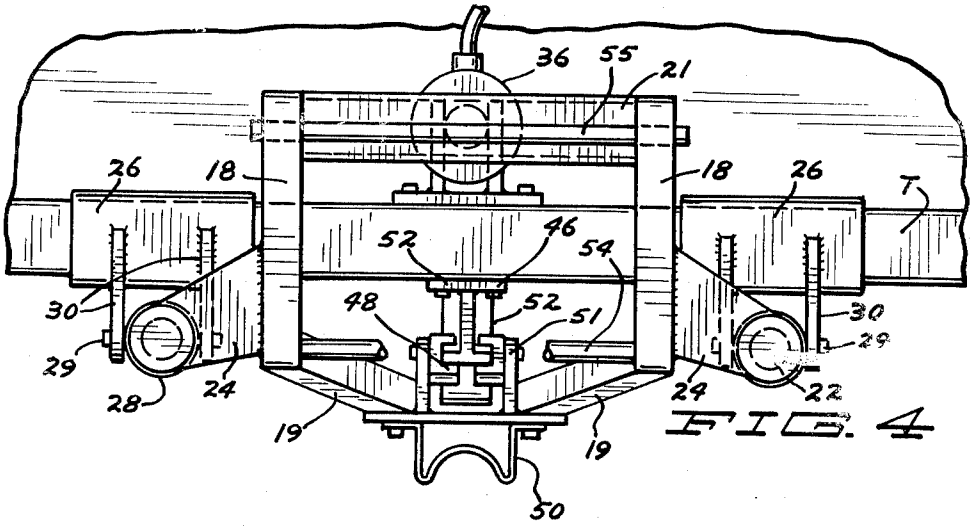
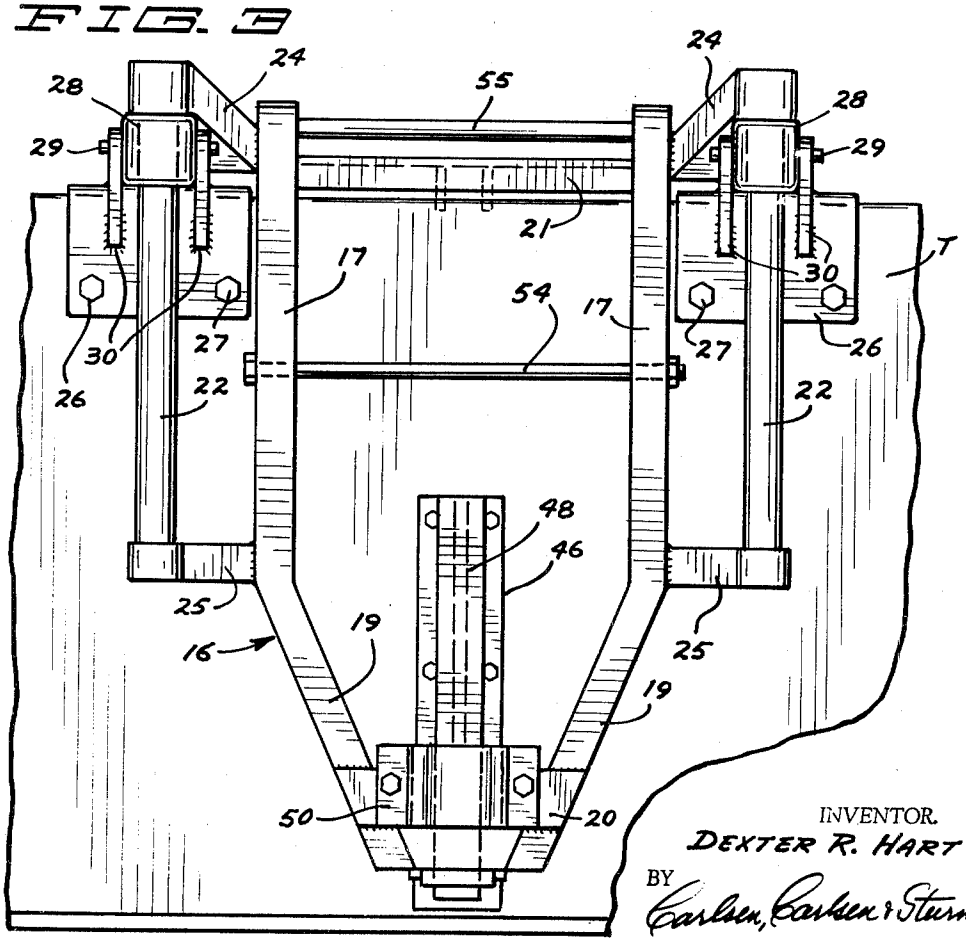


FIG. 4

FIG. 3



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OUTBOARD MOTOR MOUNTING

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6 Claims. (Cl. 248—4)

This invention relates generally to the mounting of an outboard motor on a boat transom and more particularly concerns a motor mounting structure for positioning the motor at various elevations and various angles of tilt relative to the transom.

To obtain optimum performance from an outboard motor under all operational conditions, where speed and power requirements might vary considerably, it is desirable that the motor or at least the propeller thereof be adjustable between various elevations and various angles of tilt. In the past where such adjustment means have been used, vertical and tilt adjustment have been accomplished by separate devices. In other words, there are many well known mechanisms for raising and lowering the motor relative to the transom on which it is mounted. By the same token, there are many known constructions for adjusting the tilt or trim of the motor relative to the transom for maximum performance. Moreover, both such lift devices and tilt devices have lent themselves to control or operation from a remote point.

It is an object of the present invention to combine the advantages of such devices by providing a mounting system for an outboard motor which when operated to raise or lower the motor will, without further effort, automatically adjust the motor to the proper tilt angle for maximum performance at the selected elevation.

Another object of the invention is to provide a new and improved combination power lifting and tilting mounting system for an outboard motor which can be utilized with only minor modifications in the conventional outboard motor construction and which does not in any way interfere with normal operation of the standard motor reverse lock or with free upward swinging of the motor in the event the lower unit thereof engages an underwater obstacle.

With these objects in view the invention broadly comprises a bracket means adapted to be permanently mounted on the boat transom, a pair of trunnion members pivoted on the bracket means on a common axis parallel with the transom, a motor support frame adapted to support the motor and having portions slidable in said trunnions for up and down movement of the frame and motor, selectively extendable and contractible power means extending between the frame and transom for effecting said up and down movement, and a guide means slidably interconnecting the frame and transom below said axis for tilting the frame and motor carried thereby forwardly about said axis as it is raised and rearwardly about said axis as it is lowered to thus obtain maximum efficiency from the motor propeller at any selected motor elevation.

The above mentioned and still additional objects of the invention will be brought to light during the course of the following specification, reference being made to the accompanying drawings, in which—

FIG. 1 is a side elevation of the motor mount with the motor in a lowered operative position.

FIG. 2 is a side elevation of the mount with the motor in a raised operative position.

FIG. 3 is an enlarged rear elevation of the mount with the motor removed taken along line 3—3 of FIG. 1 and looking forwardly.

FIG. 4 is a plan view of the mount with the motor removed and with the tilt pin partially broken away to show the mount lower structure.

Referring now more particularly to the drawings, reference characters will be used to denote like parts and structural features in the different views. The letter T denotes the transom which extends transversely across the rear end of boat B. A conventional outboard motor **10** having a lower unit **11** carrying the motor driven propeller **12** is mounted on the transom T by a structure forming the subject of this invention and now to be described.

The mounting frame, designated generally at **16**, can best be understood by reference to FIG. 3. A pair of transversely spaced vertical frame members **17** have forward extensions **18** at their upper ends extending over the transom T, and downwardly converging extensions **19** at their lower ends which are integrally joined by a cross plate **20**. The forward ends of the members **18** are joined by a cross bar **21**. A pair of parallel slide rods **22** are integrally mounted one on each side of the frame **16**, the rods being connected to the members **17** by upper and lower projecting elements denoted at **24** and **25** respectively.

A pair of brackets **26** are secured in transversely spaced positions to the transom T as by bolts **27**. Each of these brackets carries a sleeve or trunnion **28** which is pivoted as by trunnion pins **29** between ears **30** mounted in spaced relation on the bracket. The slide rods **22** at each side of frame **16** are respectively slidably disposed within the sleeves **28**. Accordingly, the entire frame **16** is mounted in the sleeves **28** for up and down sliding movement and limited fore and aft tilting movement with the sleeves about the axis of the pins **29** which are in transverse alignment.

A bracket **34** having a pair of transversely spaced ears **35** is mounted on the front side of transom T at the lower central portion thereof. An extensible jack **36** extends between bracket **34** and a coupling **37** mounted on the cross bar **21** with the jack cylinder **38** pivoted as by pin **39** to the coupling and with the jack piston rod **40** pivoted as by pin **41** to the bracket. Fluid lines **42** and **44** lead to opposite ends of the cylinder from suitable pump and drain sources to selectively extend or retract the jack in a well known manner. It will be readily understood that the entire frame **16** will slide upwardly in sleeves **28** as the jack is extended and will move downwardly as the jack is contracted.

An upright guide member **46** is mounted in transversely centered position on the lower back side of the transom T. This guide has a rearwardly extending center web **47** which has a cam track **48** extending along the rear edge which follows an arcuate path converging toward the transom in its downward extension.

At the lower end of the frame **16** a U-shaped thrust socket **50** is mounted on plate **20**. This socket opens rearwardly to receive and seat the leading edge of the motor lower unit. A pair of ears **51** are mounted on frame **16** forwardly opposite from the socket **50** to extend forwardly on either side of track **48**. Each of these ears pivotally carries a cam member **52** which engages the front and rear side of the track.

A reverse lock pin **54** extends crosswise between the parallel upright portions **17** of the frame **16** and a motor pivot pin **55** extends crosswise between frame portion **18** just above the cross bar **21**. The motor **10** is provided with a conventional upright steering pintle (not shown) which extends through and is journaled for rotary movement in the sleeve **57** with the upper and lower ends of the pintle being secured to vertically spaced brackets on the motor **10**, the lower being denoted at **58**. Sleeve **57** is integrally connected to a motor support bracket **59** which extends forwardly from the sleeve with the forward portion thereof journaled on the pin **55**.

The motor is accordingly in conventional manner turnable about the axis of sleeve **57** with the motor mounted pintle rotatable therein. Also the motor can be tilted forwardly to an inoperative position about the axis of pin **55**. A manually releasable reverse lock hook **60** is pivoted to tube **57** as at **61** for engagement over the cross pin **54** to hold the lower unit against the seat **50** when the motor is operated in reverse.

Operation of the invention will now be understood. When it is desirable to operate the propeller deep for general purpose boating or for pulling relatively heavy loads such as a water skier or to gain speed quickly, the jack **36** is contracted to lower the frame **16** and the motor carried thereby to the position shown in FIG. 1. Here the motor **10** is literally "tucked under" the boat using the thrust angle which tends to lift the boat toward a planing position on the water.

When a planing position has been reached maximum speed can be attained by extending the jack **36** raising the mounting frame and motor to the position shown in FIG. 2 or to some intermediate position. As frame **16** is elevated the members **52** will follow along the track **48** swinging the lower portion of the frame and motor gradually rearward away from the transom about the axis of the trunnion pins **29**. Accordingly, the angle of the propeller thrust against the transom automatically decreases as the propeller is raised in the water. The cam track **48** is designed to diverge gradually from the transom in its upward extension and is preferably curved so that the tilting movement diminishes or actually terminates during the upper reach of the motor elevating movement.

The construction can be used without substantial modification of the motor as the frame **16** merely takes the place of the conventional boat bracket. The motor support bracket **59** and steering pintle tube **57** remain unmodified and the reverse lock need not be changed. It is also significant that the motor engagement with the thrust socket **50** distributes the motor thrust pressures against the transom.

While a hydraulic lift jack is here shown for moving the frame, it will be understood that other mechanically or electrically operated extension devices might be used with equal effectiveness. It is believed to be of considerable importance that the construction disclosed makes possible the disposition of the power means, for raising and tilting the motor, entirely within the boat thus saving it from water damage and making it easily accessible for operation or repair.

The motor mounting means disclosed accordingly economically and effectively carries out the aforementioned objectives.

It is understood that suitable modifications may be made in the structure as disclosed, provided such modifications come within the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. A means for mounting an outboard motor on a boat transom which comprises a bracket for fixed attachment to the boat transom, a mounting frame mounted on the bracket for up and down sliding movement and swinging movement about an axis transverse of the boat, an outboard motor mounted in upright position on the frame for movement therewith with the motor lower unit depending therebelow, power means for selectively moving the frame up and down, an arcuate guide means adapted to be mounted on the rear side of transom below the bracket providing an upright track curving gradually in diminishing degrees away from the transom in its upward extension, and means slidably connecting the lower unit of the motor to said track whereby said motor lower unit will swing about said transverse axis toward and away from the transom as the frame is respectively moved down and up.

2. A device for mounting an outboard motor on a boat transom which comprises, a support means adapted to be fixed to the transom, a frame for carrying the motor and having pivot means for pivotal connection of the motor, means mounting the frame on the support means including a sliding connection restricting movement of the frame to a predetermined upright arcuate path disposed primarily to the rear of the transom and about an axis located substantially forwardly of the pivot means and parallel to the transom, and an elongated length adjustable means extending between the frame and support means for moving the frame along said path.

3. The subject matter of claim 2 wherein said length adjustable means comprises an extensible jack member disposed in upright position forward of the transom having one end adapted for pivotal connection to the transom and its other end pivotally connected to the frame.

4. A means for mounting an outboard motor on and to the rear of a boat transom which comprises a bracket integrally secured to the transom, tubular trunnion means disposed to the rear of the transom and pivoted to the bracket for movement about an axis parallel to the transom, a frame adapted to support the motor, said frame having a cylindrical slide rod journaled in the trunnion means for axial sliding movement therein, an extensible power means acting between the frame and transom for effecting said sliding movement of the frame, an upright guide track mounted on the rear of the transom and diverging from the transom in its upward extension, and a track follower mounted on the frame in sliding engagement with said track to cause the frame to swing about said pivot during said sliding movement of the frame.

5. In a device for mounting an outboard motor, having a forwardly extending motor support member, upon a transom extending transversely across the rear of a boat with the motor disposed to the rear of the transom in operative position, bracket means adapted to be integrally secured to the transom, a pair of transversely spaced trunnion sleeves pivoted on the bracket means for pivotal movement about a common transverse axis, a frame member having a pair of parallel slide rods slidably disposed one in each trunnion sleeve for raising and lowering movement of the frame therein, the frame having a portion extending forwardly over the transom, means for connecting the motor support member to said frame portion, an extensible and contractible jack disposed forward of the transom and acting between the transom and said frame forward portion for raising and lowering the frame in said sleeves, a vertical guide track transversely centered on the rear side of the transom and converging toward the transom in its downward extension, track follower means on the frame below said slide rods in slidable engagement with the track to cause the frame to tilt forwardly about said transverse axis as

the jack is extended to raise the frame and rearwardly about the axis as the jack is retracted to lower the frame.

6. A means for mounting an outboard motor on and to the rear of a boat transom which comprises motor support means adapted to be integrally secured to the transom, trunnion means disposed to the rear of the transom and pivoted to the support means for movement about an axis parallel to the transom, a frame for carrying the motor, said frame having a slide rod journaled in the trunnion means for axial sliding movement therein, an extensible power means acting between the frame and support means for effecting said sliding movement of

the frame, said support means including an upright guide track to the rear of the transom and diverging therefrom in its upward extension, and a track follower on the frame in sliding engagement with the track to cause the frame to swing about said trunnion means pivot during said sliding movement of the frame.

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